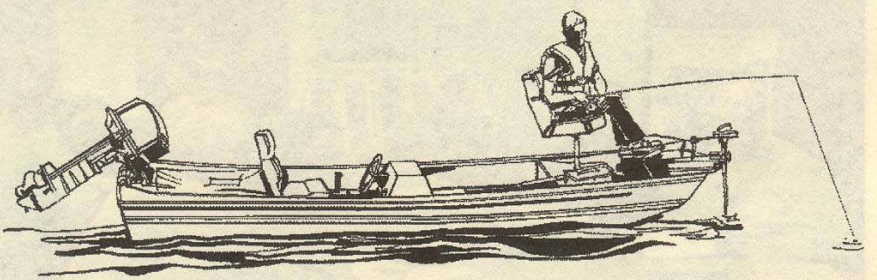
WATERSHED MANAGEMENT PLAN
BRUSH CREEK

VISION

"Improved water quality while protecting and enhancing our soil, forestry, and wildlife resources."

BRUSH CREEK WATERSHED PROJECT

The Brush Creek Fish and Wildlife Area provides recreational opportunities to many surrounding communities and rural residents. The Brush Creek Reservoir provides fishing for approximately 16,200 people a year. The area also provides a valuable wildlife habitat for numerous kinds of birds, animals and reptiles. Hiking and bird watching play a large role in the recreation of the area for approximately 1,500 people a year. The Brush Creek Reservoir is a back up water supply for the City of North Vernon. This valuable area faces several environmental concerns, which are addressed in this document. Implementing this watershed project will help conserve this resource for future generations to enjoy.



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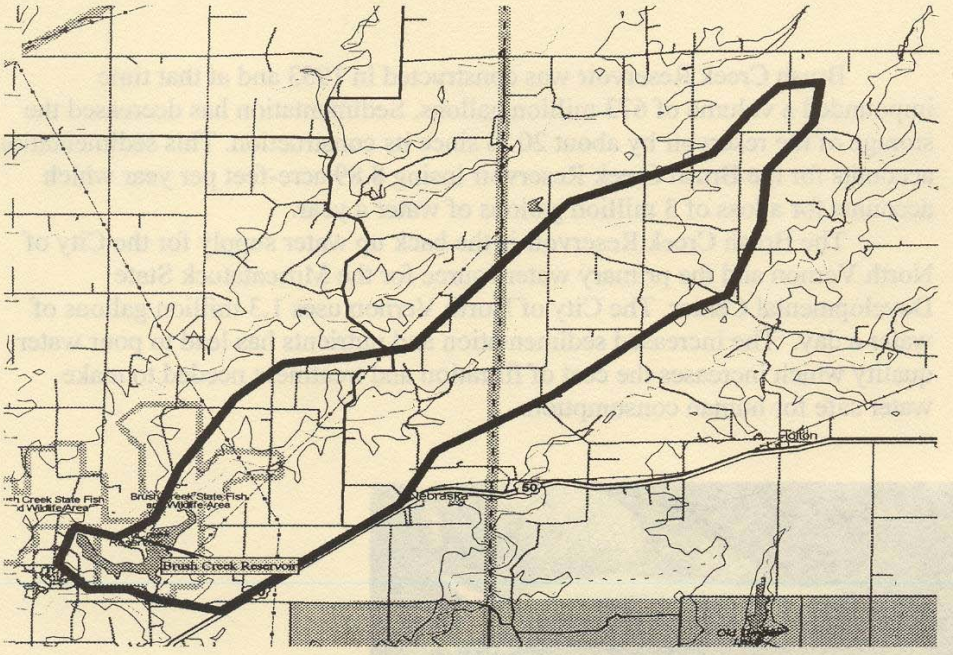
MISSION

" Provide education, financial assistance, and information to encourage conservation in the Brush Creek Watershed."

Brush Creek Watershed Committee

LOCATION

Jennings County *Ripley County*



Brush Creek is a tributary of Vernon Fork of the Muscatatuck River, originating in northwestern Ripley County and flowing through Jennings County. It converges with Vernon Fork of the Muscatatuck River north of the Muscatatuck State Development Center facility in Butlerville, IN. The Brush Creek Watershed is approximately 14.4 square miles (9,240 acres) in size. Fifty-four percent of the watershed lies in Jennings County, while forty-six percent of the watershed lies in Ripley County. The dam of Brush Creek is located north of Butlerville which impounds the 149 acre reservoir. This Reservoir allows water to be released into the Muscatatuck River where it is drawn for water by North Vernon.

RESOURCE INVENTORY

⇒	Watershed total acreage	9,240 acres
⇒	Cropland	4,435 acres
⇒	Forestland	2,956 acres
⇒	Pasture	1,478 acres
⇒	Residential	277 acres
⇒	Waterbodies	92.4 acres
⇒	Cattle access to Stream	50 animals (approx.)

PROBLEMS AND CONCERNS

Brush Creek Reservoir was constructed in 1953 and at that time impounded a volume of 673 million gallons. Sedimentation has decreased the storage of the reservoir by about 20 % since its construction. This sedimentation accounts for the Brush Creek Reservoir losing 8.89 acre-feet per year which accounts for a loss of 3 million gallons of water a year.

The Brush Creek Reservoir is the back up water supply for the City of North Vernon and the primary water source for the Muscatatuck State Developmental Center. The City of North Vernon uses 1.3 million gallons of water a day. The increased sedimentation and nutrients has lead to poor water quality which increases the cost of filtration and treatment needed to make water safe for human consumption.

Gizzard Shad

The Brush Creek Reservoir is a large source of recreation for the surrounding communities. Anglers have reported in recent years a decline in the fisheries. The 1991 DNR Fish Management Report showed the predominant species was Bluegill followed by Largemouth Bass. The 1999 DNR Fish Management Report showed Gizzard Shad had been illegally introduced and is now the predominant species. The shad offer very little angling opportunities and have replaced 35% of the fish by number and 21% by weight. At the public meeting held on December 12, 2001 at SEPAC, concerns were raised about decreased submerged vegetation in the reservoir. High turbidity and herbicide levels have potential to decrease submerged vegetation which are factors influenced by runoff.

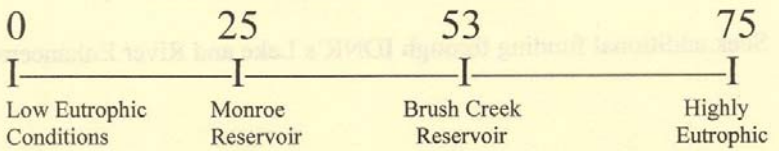
The majority of the soils found within the watershed are classified as highly erodible land (HEL).The HEL fields are defined by the USDA as having at least 1/3 of their field acreage in highly erodible soils. Highly erodible soils have been determined based on slope and erodibility factors. From visual observation, less than half of the cropland acres are in a reduced tillage system or no-tilled. Unprotected cropland (soil particles) erode during heavy rainfall events, resulting in soil deposition in the streams and reservoir. The soil particles carry nutrients during the erosion process.

The watershed also has several small cattle operations, which have full access to the streams. Presence of cattle in the streams contributes to increased nutrients and erosion conditions.

The diagnostic study completed by Donan Engineering Inc. in 2001 indicated elevated Phosphorus (P) levels within the water samples collected. Phosphorus enters surface water in organic matter (dead plants, animals) or attached to soil particles, or in man made products (fertilizers, detergents). When phosphorus levels are elevated plant and algal growth creates water quality problems. The study also indicated the reservoir has become eutrophic. Eutrophic can be defined as the process by which lakes and streams become enriched by concentrations of nutrients, such as nitrogen and phosphorus.

The Brush Creek Reservoir has experienced sedimentation which has limited the access to the reservoir for recreation. The boat ramp would be unusable during dry conditions due to the sedimentation at the ramp.

The Brush Creek Reservoir was constructed in 1956. The dam of the reservoir has developed small seepages through the dam itself. The presence of these seeps and a newly developed sinkhole has lead to concerns for the safety of the dam structure.



OBJECTIVE

Implementing a variety of conservation practices throughout the watershed will help reduce the problems and concerns listed in this document. Reducing phosphorus loads in the watershed will lessen the eutrophic condition in the reservoir. Sediment removal in the boat ramp area will provide more recreational opportunity and also remove phosphorus (which is attached to the sediment). Reducing the sedimentation into the lake, along with reducing the nitrogen and phosphorus within the watershed will help reduce turbidity. The reduced turbidity should help increase submerged vegetation which provide food sources and hiding areas for small fish. Less nutrients in the water will also decrease algal growth that often occurs in the summer.

GOALS

Goal A: Achieve a 1350 ton sediment load reduction, a 1700 lb. Phosphorus load reduction, and a 2500 lb. Nitrogen load reduction on agricultural land through the implementation of conservation practices by 2005.

Goal B: Improve the recreational accessibility to the reservoir

Goal C: Increase participation in the Classified Wildlife Habitat Act from 180 acres to 210 acres by 2005.

Goal D: Increase participation in the Classified Forest Act from 460 to 560 acres by 2005.

Goal E: Improve water delivery system from Brush Creek Reservoir.

Goal F: Monitor the status of the Brush Creek Reservoir's Dam

Goal G: Seek additional funding through IDNR's Lake and River Enhancement

ACCOMPLISHMENTS
through October 2002

GOAL A: Achieve a 1350 ton sediment load reduction, a 1700 lb. Phosphorus load reduction and a 2500 lb. Nitrogen load reduction on agricultural land through the implementation of conservation by 2005.

CONSERVATION PRACTICES INSTALLED

- 9,364 Feet of filter strip
- 3881 Acres of No-Till
- 524 Acres of Hayland Planting

TOTAL REDUCTION

- 1,121 tons of sediment (56 tri-axle dump truck loads)
- 1,244 pounds of phosphorus
- 2,490 pounds of nitrogen

GOAL B: Improve the recreational accessibility to the reservoir

- Boat ramp channel dredged December 2001
- 40 foot wide at ramp feathered to 70 foot wide, 450 foot away from ramp
- Remover 1,431 tons of sediment removed (71 tri-axle dump truck loads)

GOAL C: Increase participation in the Classified Wildlife Habitat Act from 180 acres to 210 acres by 2005.

- Wildlife Biologists are assisting landowners within watershed

GOAL D: Increase participation in the Classified Forest Act from 460 to 560 acres by 2005.

- District forester working with landowners on timber management within the watershed

GOAL E: Improve water delivery from Brush Creek Reservoir.

- Engineering study started in 2002 looking to redesign the intake pipe to draw water from a higher level to improve water quality

GOAL F: Monitor the status of the Brush Creek's Reservoir's Dam

- Engineering study started August 2002 to review the safety of the dam

GOAL G: Seek additional funding through IDNR Lake and River Enhancement

- Indiana Department of Natural Resources Lake and River Enhancement awarded an additional $30,000 to combine with the original $18,000 for the watershed project

Brush Creek Reservoir Dredging
December 2001

PARTNERSHIP

Jennings County Soil & Water Conservation District
Ripley County Soil & Water Conservation District
Indiana Department of Natural Resources – Division of Fish & Wildlife
Indiana Department of Natural Resources – Division of Forestry
Indiana Department of Natural Resources – Division of Soil Conservation
Indiana Department of Natural Resources – Division of Water
USDA Natural Resources Conservation Service
Muscatatuck State Developmental Center
City of North Vernon

STEERING COMMITTEE

Member	Affiliation
Becky Asche	Ripley County SWCD
Larry Allsop	Property Manager of Brush Creek Reservoir IDNR Division of Fish & Wildlife
Jomary Crary	IDNR– Division of Water
Andy Ertel	USDA Natural Resources Conservation Service
Jim Farr	IDNR – Division of Soil Conservation
Chris Grauel	IDNR – Division of Fish & Wildlife
Ed Guljas	IDNR – Division of Fish & Wildlife
Kim Lampert	USDA Natural Resources Conservation Service
Larry Lehman	IDNR – Division of Fish & Wildlife
Ken Lane	USDA Natural Resources Conservation Service
Rob McGriff	IDNR – Division of Forestry
Tim Schwipps	Jackson/Jennings/Ripley Counties SWCD
Roger Simmons	Jennings County SWCD Board member
Pauline Stevens	Muscatatuck State Developmental Center
Mark Thomas	IDNR – Division of Soil Conservation
Jenny Vogel	USDA Natural Resources Conservation Service

FUNDING SOURCES

Department of Natural Resources
- Division of Soil Conservation -Lake and River Enhancement
- Division of Water
- Fish & Wildlife Cost-Share

Quail Unlimited and National Turkey Federation Partnership
USDA – Natural Resource Conservation Service